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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,906	08/09/2006	Hugo Streekstra	4662-263	4642
23117 7590 05/11/2010 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
BADR, HAMID R				
ART UNIT		PAPER NUMBER		
1781				
MAIL DATE		DELIVERY MODE		
05/11/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/588,906

Applicant(s)

STREEKSTRA ET AL.

Examiner

HAMID R. BADR

Art Unit

1781

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-10 and 12-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Applicants' amendment filed 02/09/2010 is acknowledged.

Rejection under 35 U.S.C 101 regarding use claims is withdrawn due to cancellation of claims by Applicants.

Rejection of claim 3 under 35 U.S.C. 112 second paragraph is withdrawn per Applicants' amendment of claim 3.

New grounds of rejections are set forth below.

Claims 1, 3-10, and 12-14 are being considered on the merits.

Documents Required

A certified copy of foreign application is on file and acknowledged.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 3-10 and 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite for "modifying side chains of the amino acid asparagine or glutamine". The metes and bounds of the claim are unclear due to the recitation of the term 'modifying'. It is unclear as to what type of modification is performed, what process steps are involved, and what end result is accomplished and encompassed by the term 'modifying'."

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zyzak et al. (2003, Acrylamide formation mechanism in heated foods; hereinafter R1) in view of Amrein et al. (2003, Potential of acrylamide formation , sugars and asparagine in potatoes: A comparison of cultivars and farming systems, hereinafter R2) and JP 80035108 (hereinafter R2).

3. R1 discloses a mechanism for the formation of acrylamide from the reaction of the amino acid asparagine and a carbonyl containing compound at typical cooking temperatures. (Abstract). R1 discloses the formation of acrylamide in a model food system resembling potato chip. (page 4782, col. 2, Model fried potato snack system).

4. R1 discloses that asparagine and glutamine are the only amino acids tested that form acrylamide, and the higher yield of acrylamide from asparagine demonstrates that it is the predominant amino acid responsible for the formation of acrylamide. In addition D-glucose is needed for the efficient formation of acrylamide. (Page 4783, Results and discussion).

5. R1 gives the details of the reactions of asparagine and glucose and concludes that the side chain amide group of asparagine is incorporated into the amide bond of acrylamide. To confirm this mechanism, R1 suggests to use either acid or enzymes to

hydrolyze the amide bond in asparagine, and measure the acrylamide in a food. R1 further recommends using asparaginase which catalyzes the hydrolysis of asparagine to aspartic acid and ammonia. R1 further reports a 99% reduction of acrylamide in the foods which were treated with asparaginase enzyme compared to foods prepared without the enzyme. (page 4787, col. 1, Verification of asparagine as the source of acrylamide in a food).

6. R1 is silent regarding the formation of acrylamide in real food materials and source of asparaginase used.
7. R2 discloses the precursors of acrylamide formation in potato products.
8. R2 discloses that particularly high concentrations of acrylamide were found in products of plant origin heated to high temperatures, such as potato chips, French fries, pan-fried potato products or crisp bread (Introduction, second paragraph)
9. R2 discloses that potato tubers contain substantial amounts of the acrylamide precursors free asparagine, glucose and fructose which may explain the high concentrations of acrylamide in certain potato products. (Introduction, second column, second paragraph).
10. Given that R2 discloses the concentrations of asparagine, glucose and fructose in potatoes, reduction of asparagine concentration through using sufficient amounts of asparaginase can be controlled resulting in predetermined reductions in acrylamide concentration as presently claimed in claims 3, 13 and 14.

11. Therefore, treating such products with asparaginase to convert asparagine to aspartic acid and therefore prevent its reaction with glucose or fructose would have been obvious to an artisan.

12. R2 is silent regarding the source of asparaginase enzyme.

13. R3 discloses a process for the production of asparaginase using *Aspergillus* species. (Abstract).

14. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to convert asparagine through using asparaginase; to reduce the formation of acrylamide, as taught by R1, and treat the surface of foods disclosed by R2, using a fungal source of the enzyme as disclosed by R3. One would do so to reduce the toxic effects of acrylamide in foods in which the reaction of asparagine and a reducing sugar is inevitable due to high temperatures of cooking. Absent any evidence to contrary and based on the combined teachings of the cited references, there would be a reasonable expectation of success in applying asparaginase to the surface of an intermediate form of the food or feed to reduce the formation of acrylamide in heated food.

Response to Arguments

Applicants arguments have been reviewed thoroughly. These arguments are not persuasive for the following reasons.

1. Applicants argue that R1 discloses the application of Asparaginase in a slurried preparation, whereas the present invention discloses the application of asparaginase to the surface of an intermediate food.
 - a. New ground of rejection necessitated by the amendment clearly shows that the problem of acrylamide was known in potato products at the time of the present invention. R1 clearly discloses the role of asparaginase in converting asparagine to aspartic acid and therefore preventing it from participating in acrylamide formation. Since thin slices of potato or French fries have both the asparagine and glucose on the surface and through the body of pieces (please see R2 above) , it would have been obvious to treat the surface of food intermediate by e.g. dipping it into a solution of asparaginase to convert asparagine to an inactive compound such as aspartic acid.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAMID R. BADR whose telephone number is (571)270-3455. The examiner can normally be reached on M-F, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hamid R Badr
Examiner
Art Unit 1794

/Keith D. Hendricks/
Supervisory Patent Examiner, Art Unit 1781